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ABSTRACT

The study sought to examine developmental processes of substitution in the pretend play of Down's syndrome children and to clarify the onset mechanism of subskills in decontextualization, which refers to the progress from imitation to substitution and then to invention. Eighteen Japanese children, aged 29-55 months, with Down's syndrome were given various lifelike objects, miniature toys, and ambiguous objects, and observed in their manipulation of the objects in play with their mothers. The developmental process of decontextualization in Down's syndrome children was the same as that in nonretarded children in previous studies. However, the onset of substitution showing double knowledge of objects (type 2) was delayed and the repertory of substitution hardly increased. Delayed emergence in type 2 substitution and little increment in the repertory of substitution suggest a relation to delayed language development in Down's syndrome children. (JDD)

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DEVELOPMENT OF SUBSTITUTION IN THE PRETEND PLAY WITH DOWN'S SYNDROME YOUNG CHILDREN

Shoko SHIMADA*

Key words: pretend play, symbolic play, substitution, decontextualization, Down's syndrome children

Development of early pretend play or symbolic play has been studied from 3 points of view: decentration, decontextualization, and integration (see the reviews of Fein, 1981; McCune-Nicolich, 1981; McCune-Nicolich & Fenson, 1984; Rubin et al., 1983). Decentration means to direct actions towards from the self to objects and others. Integration concerns combining separate actions in coordinated sequences. Decontextualization refers to decreased environmental support and progresses from imitation to substitution and then to invention. The substitution with ambiguous objects and miniature toys prior to imitative use of the same toys (type 1) was demonstrated at earlier months than substitutive use with miniature toys after imitative use of the counterparts (type 2) in nonretarded children, while most of the signifier and the signified were similar in form and/or quality until the age of 24 months (Shimada et al., 1981). The type 1 of substitution is considered as showing one meaning of an object whereas the type 2 expresses new meaning in addition to the conventional meaning of the object. McCune-Nicolich (1981) also pointed out such substitution as the type 2 showing double knowledge of the object appeared at later months.

The development of pretend play in retarded children has been shown to be correlated with developmental or mental age (DA, MA) rather than chronological age (CA) (Hill & McCune-Nicolich, 1981; Jeffree & McConkey, 1976; Wing et al., 1977). Children with Down's syndrome (DS) demonstrated similar processes with developmental age to the nonretarded (Shimada, 1986). However, progression from the type 1 to the type 2 of substitution has not been examined yet in DS children.

This study was aimed at examining developmental processes of substitution in DS children and clarifying the onset mechanism of subskills in decontextualization.

METHOD

1. Subjects

The samples were 18 Japanese standard trisomy Down's syndrome children (10 males, 8 females) from middle class families. The ranges of the CAs and DAs of the children were 29-55 months and 21-35 months, respectively. The DA was measured by a standardized Developmental Questionnaire (Tsumori & Inage, 1961) which is composed of 5 domains: motor, cognitive, social, self-help and language development. The mean of the DQs was 68.7 (SD = 6.7) with a range of 54-76. All of the children had experienced Portage early intervention program (Yamaguchi, 1983). The children were divided into two groups based on DA with 9 children per group and an equal number of males and females per group. The mean and standard deviation of the DAs of each group were 22.7 months (1.6) for the low group (L) and 31.1 months (2.0) for the high group (H).

2. Materials

The materials used were 2 dolls, a stuffed toy dog either dressed as a boy or girl (30 cm in height), various miniature toys and ambiguous objects. The miniature toys consisted of cooking and feeding utensils (a pan, kettle and table, and 2 tea cups, spoons, plates, rice bowls and pairs of chopsticks);

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bedding (a coverlet, bed mat and pillow); grooming and dressing materials (a hand mirror, comb, bag and hat); baseball set (a bat and 2 balls); and cars (a truck and an open car). The ambiguous objects consisted of 2 pieces of paper (18 × 25 cm), 2 pieces of cardboard (10 × 10 cm), a piece of cloth (40 × 40 cm), a piece of string (150 cm in length), 6 square sponges (2 × 3 × 2 cm), 3 types of twigs (large, small, Y-shaped; 10-20 cm in length; two each), 2 wooden blocks (3 × 15 × 1 cm), 3 cylinder-shaped wooden blocks (2.5 cm in diameter, 10 cm in length), a box (11 × 20 × 6 cm) and 2 round cans (7 cm in diameter, 3 cm in depth).

3. Procedure

The children were individually tested in their own homes with their mothers present. The mother was instructed neither to initiate nor to teach the manipulation of materials. She was encouraged, however, to play with her child, limiting her pretend behavior to her child's repertory when her child approached her in that way. A female experimenter behaved in the same manner. All materials were introduced simultaneously on the floor. The 10 min. play was videotaped. After the session, the experimenter told the mother about her child's developmental level of play and suggested in concrete ways to facilitate her child's development.

4. Data Reduction

The videotapes were transcribed with a given form. Each pretend action of the child was assigned to all of 3 categories; decentration, decontextualization and integration. Subcategories of decentration were self, object, passive other, active other I and active other II. Subcategories of decontextualization and integration were imitative, substitutive (type 1 and type 2) and inventive for decontextualization, and single, single scheme and multischeme for integration. The definitions of subcategories were the same as those in Shimada & Sano (1984) except for active other agent use of decentration. Active other agent use was divided into 2 subcategrories in this study. Active other I refers to gross movement of lifelike objects, e.g., have them stand, walk, sit down or jump. Active other II was defined as fine movement of lifelike objects, e.g., having them hold a spoon or rice bowl and eat with it. In terms of substitutive use of miniature toys, the difference between the type 1 and the type 2 was determined based on the child's behavior prior to the appearance of substitution in the same session and the mother's information on her child's everyday play behavior.

The frequency, the number of different acts and the number of different substitution or invention were measured for decontextualization. When the child ate from a can (as a rice bowl) with a pair of chopsticks and washed the can with his or her hands, the number of different acts was counted as two and the number of different substitution was as one. Decentration was scored from one to five for subcategories of decontextualization according to developmental transition: e.g., self was credited as one and active other II was as five. Since no children showed single scheme combinations, integration was scored for subcategories of decontextualization based on the number of different acts in a sequence: e.g., a single act was counted as one and the combination of 2 different acts was as two. The highest scores of decentration and integration for subcategories of decontextualization were used as the child's scores.

The assess reliability, the records of 4 children (2 from each group) were scoreed by a second trained coder. The ratio of agreement was 91%-97%.

RESULTS

1. Development in Decontextualization

Imitative and substitutive use of the objects was observed in all children. Invention was demonstrated in 3 out of 9 children of the H group (33%), but not in the L group. As shwon in Fig. 1, the mean scores of all measures of the L group were significantly higher in imitative than substitutive use ($t = 3.72$, $P < .01$ for frequency; $t = 3.91$, $P < .01$ for the number of different acts; $t = 3.33$, $P < .02$ for integration; $t = 2.57$, $P < .05$ for decentration; $df = 8$, two-tailed). Comparing the mean scores of substitution measures (Fig. 2), the H group was superior to the L group except for the number of different substitution ($t = 1.80$, $.1 > P > .05$ for frequency; $t = 1.92$, $.1 > P > .05$ for the number of different acts; $t = 0.94$, $.4 > P > .3$ for the number of different substitution; $t = 1.82$, $.1 > P > .05$ for integration; $t =$

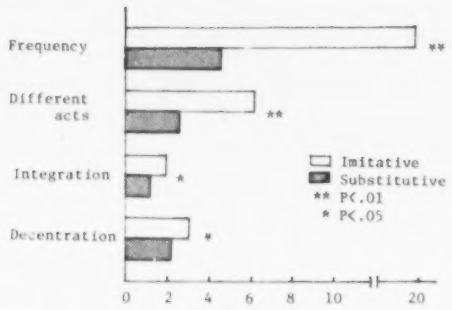

Fig. 1 Mean Scores of Low DA Group in Imitative and Substitutive Use

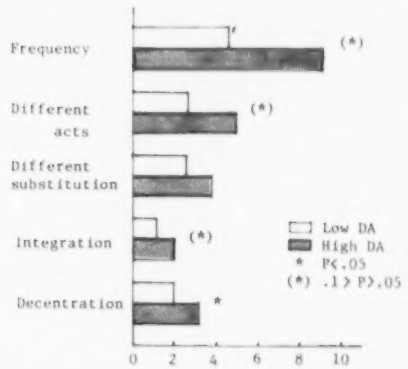

Fig. 2 Mean Scores of Two DA Groups in Substitution

2.22, $P < .05$ for decentration; df = 16, two-tailed). The developmental trend of decontextualization was obtained from imitative to substitutive and then to inventive use of the objects.

2. Development of Substitution

The type 1 of substitution was shown in all children. There were no significant differences in the mean scores between the 2 groups except for decentration ($t = 2.11$, $.1 > P > .05$, df = 16, two-tailed for decentration) (Fig. 3). The type 2 of substitution was observed in 3 children of the L group (33% children) and in 8 children of the H group (89%). The H group exhibited more children with significance ($\chi^2 = 5.84$, df = 1, $P < .02$, two-tailed). The progression from the type 1 to the type 2 of substitution was

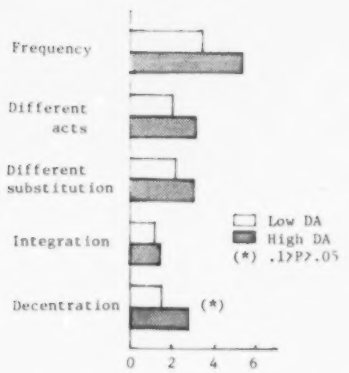

Fig. 3 Mean Scores of Two DA Groups in Type 1 of Substitution

Table 1 Total Number of Different Substitution Contents

DA Groups	Type 1		Type 2	
	signifier	signified	signifier	signified
Low	12	19	3	3
High	10	19	5	7

shown.

As seen in Table 1, there was no marked differences in the contents of either type of substitution between the 2 groups. The perceptual similarity between the signifier and the signified was observed in all substitution. Besides, the substitution reflected the children's experiences in their everyday life. The examples of substitution demonstrated by more than 2 children included a can as a rice bowl, a ball as an egg, a piece of string as a string for carrying a doll on his or her back (such a way of carrying a baby is a Japanese custom), a table as a stool, a Y-shaped twig as a pair of scissors or a lollipop, a sponge as a powder puff, a wooden block as a knife, and a bat as a golf club.

In the type 1 of substitution, the substitution supported by imitative use of the objects occurred more often in the L group than the H group (42% substitution for the L group and 11% for the H group). An instance of such substitution was eating with a rice bowl and then eating with the rice bowl and small twigs as a pair of chopsticks. The sub-

stitution emitted by the previous action was observed in 3 children of the H group who did not show invention yet. An example of such substitution was winding a piece of string around his or her body and then carrying a doll on his or her back with the string.

DISCUSSION

The same developmental process of decontextualization was obtained in DS children as that in nonretarded children revealed by the author's previous study (Shimada et al., 1981): that is, the progression of imitative use → the type 1 of substitution → the type 2 of substitution → invention. Since the 2 groups did not differ in the type 1 of substitution except for one measure, the gap of substitution between the 2 groups may be considered to depend on the onset of the type 2 of substitution. The measure which did not show the differences between the 2 groups was merely the number of different substitution. It was also supported by the contents of substitution. In other words, the repertory of substitution itself hardly increases in DS children at this DA level, while the repertory of acts does in substitution.

When re-analyzing the data of nonretarded children of Shimada et al. (1981, 1984), the number of different substitution tended to significantly increase between 22 and 30 months of age ($t = 1.81$, $.1 > P > .05$, $df = 13$, two-tailed). Moreover, 79% nonretarded children of 22 months demonstrated the type 2 of substitution, whereas 33% DS children did so in the L group of this study ($\overline{DA}$ in the L group = 22.7 months). The difference of the number of children showing the type 2 of substitution was significant between the nonretarded and DS children ($\chi^2 = 4.70$, $P < .05$, $df = 1$, two-tailed).

Decontextualization is regarded as the process of distancing between the signifier and the signified. Therefore, delayed emergence in type 2 of substitution and little increment in the repertory of subinstitution suggest a relation to delayed language development in DS children.

The substitution supported by imitative use of objects appeared more often in the L group, and the substitution emitted by the preceding action occurred in the children of the H group who did not demonstrate invention yet. In the author's prior study with nonretarded children (Shimada et al., 1979), the same developmental process was observed: namely, the type 1 of substitution with support of imitative use → the type 1 of substitution without any support of imitative use → the type 2 of substitution → the substitution emitted by the previous action. Such transition may be interpreted as those mentioned below. Children can perform substitution based on merely resemblance between the signifier and the signified, after assuring the actions of substitution supported by imitative use of objects. Following the substitution with miniature toys producing additional meaning based on the similarity, the representation of actions is more assured. And then invention, gestural expression without any material support, emerges.

Thus, the shift in dominance of a perceptual resemblance and actions suggests the onset of subskills in decontextualization. Since the substitution with miniature toys, which demonstrated double knowledge of the objects as well as dissimilarity between the signifier and the signified, appeared at later months than invention (Saso et al., 1981), the development of making a story may also function as a factor.

SUMMARY

The purpose of this study was examine developmental processes of substitution in DS children and to clarify the onset mechanism of subskills in decontextualization.

The subjects were 18 Down's syndrome children with a DA range of 21-35 months who were divided into 2 DA groups. The children were individually tested with lifelike objects, miniature toys and ambiguous objects.

The developmental process of decontextualization in DS children was the same as that in nonretarded children of the previous studies. However, the onset of substitution showing double knowledge of objects (type 2) was delayed and the repertory of substitution hardly increased. The results suggest a relation to delayed language development in DS children. Further analyses of substitution suggest the shift in superiority of perceptual similarity and actions for the onset of subskills in decontextualization.

ACKNOWLEDGEMENTS

A portion of this study was presented at the 26th Annual Convention of the Japanese Association of Special Education.

The author wishes to thank Mr. M. Shinya and Ms. T. Habara for their help in videotape recording and data reduction. Acknowledgement is also due to the children and their mothers.

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ダウン症幼児の象徴遊びにおける見たて使用の発達

キーワード：象徴遊び，見たて，脱文脈化，ダウン症幼児

本研究は，象徴遊びにおける見たて使用の発達と，脱文脈化における下位スキル出現メカニズムの検討を目的とした。被験者はダウン症児18名（CA 29−55ヶ月，DA21−35ヶ月）であり，DAを基準にして9名ずつ2群別にし，一定材料を用いて個別観察をした。ダウン症児における脱文脈化の発達過程は，健常児を対象とした諸研究の知見と同一であった。しかしながら，慣習的意味に新たな意味を付加する見たて2の出現が遅れ，見たての種類の増加が緩慢であり，言語発達の遅れとの関連性が示唆された。見たて使用の分析から，脱文脈化における下位スキル出現メカニズムとして，能記ー所記の類似性と行為における優位性の交替が示唆された。

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This study was aimed at examining developmental processes of substitution in DS children and clarifying the onset mechanism of subskills in decontextualization.

METHOD

1. Subjects

The samples were 18 Japanese standard trisomy Down's syndrome children (10 males, 8 females) from middle class families. The ranges of the CAs and DAs of the children were 29-55 months and 21-35 months, respectively. The DA was measured by a standardized Developmental Questionnaire (Tsumori & Inage, 1961) which is composed of 5 domains: motor, cognitive, social, self-help and language development. The mean of the DQs was 68.7 (SD = 6.7) with a range of 54-76. All of the children had experienced Portage early intervention program (Yamaguchi, 1983). The children were divided into two groups based on DA with 9 children per group and an equal number of males and females per group. The mean and standard deviation of the DAs of each group were 22.7 months (1.6) for the low group (L) and 31.1 months (2.0) for the high group (H).

2. Materials

The materials used were 2 dolls, a stuffed toy dog either dressed as a boy or girl (30 cm in height), various miniature toys and ambiguous objects. The miniature toys consisted of cooking and feeding utensils (a pan, kettle and table, and 2 tea cups, spoons, plates, rice bowls and pairs of chopsticks);

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The children were individually tested in their own homes with their mothers present. The mother was instructed neither to initiate nor to teach the manipulation of materials. She was encouraged, however, to play with her child, limiting her pretend behavior to her child's repertory when her child approached her in that way. A female experimenter behaved in the same manner. All materials were introduced simultaneously on the floor. The 10 min. play was videotaped. After the session, the experimenter told the mother about her child's developmental level of play and suggested in concrete ways to facilitate her child's development.

4. Data Reduction

The videotapes were transcribed with a given form. Each pretend action of the child was assigned to all of 3 categories; decentration, decontextualization and integration. Subcategories of decentration were self, object, passive other, active other I and active other II. Subcategories of decontextualization and integration were imitative, substitutive (type 1 and type 2) and inventive for decontextualization, and single, single scheme and multischeme for integration. The definitions of subcategories were the same as those in Shimada & Sano (1984) except for active other agent use of decentration. Active other agent use was divided into 2 subcategrories in this study. Active other I refers to gross movement of lifelike objects, e.g., have them stand, walk, sit down or jump. Active other II was defined as fine movement of lifelike objects, e.g., having them hold a spoon or rice bowl and eat with it. In terms of substitutive use of miniature toys, the difference between the type 1 and the type 2 was determined based on the child's behavior prior to the appearance of substitution in the same session and the mother's information on her child's everyday play behavior.

The frequency, the number of different acts and the number of different substitution or invention were measured for decontextualization. When the child ate from a can (as a rice bowl) with a pair of chopsticks and washed the can with his or her hands, the number of different acts was counted as two and the number of different substitution was as one. Decentration was scored from one to five for subcategories of decontextualization according to developmental transition: e.g., self was credited as one and active other II was as five. Since no children showed single scheme combinations, integration was scored for subcategories of decontextualization based on the number of different acts in a sequence: e.g., a single act was counted as one and the combination of 2 different acts was as two. The highest scores of decentration and integration for subcategories of decontextualization were used as the child's scores.

The assess reliability, the records of 4 children (2 from each group) were scoreed by a second trained coder. The ratio of agreement was 91%-97%.

RESULTS

1. Development in Decontextualization

Imitative and substitutive use of the objects was observed in all children. Invention was demonstrated in 3 out of 9 children of the H group (33%), but not in the L group. As shwon in Fig. 1, the mean scores of all measures of the L group were significantly higher in imitative than substitutive use ($t = 3.72$, $P < .01$ for frequency; $t = 3.91$, $P < .01$ for the number of different acts; $t = 3.33$, $P < .02$ for integration; $t = 2.57$, $P < .05$ for decentration; $df = 8$, two-tailed). Comparing the mean scores of substitution measures (Fig. 2), the H group was superior to the L group except for the number of different substitution ($t = 1.80$, $.1 > P > .05$ for frequency; $t = 1.92$, $.1 > P > .05$ for the number of different acts; $t = 0.94$, $.4 > P > .3$ for the number of different substitution; $t = 1.82$, $.1 > P > .05$ for integration; $t =$

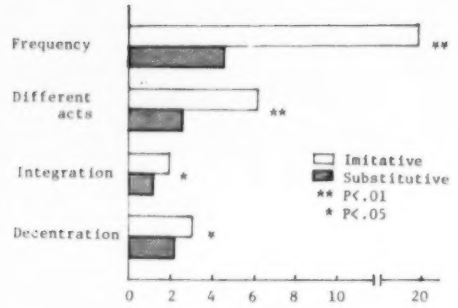

Fig. 1 Mean Scores of Low DA Group in Imitative and Substitutive Use

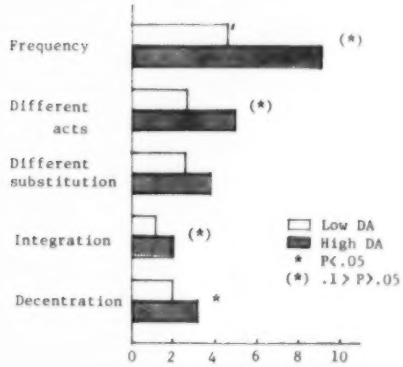

Fig. 2 Mean Scores of Two DA Groups in Substitution

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2. Development of Substitution

The type 1 of substitution was shown in all children. There were no significant differences in the mean scores between the 2 groups except for decentration ($t = 2.11$, $.1 > P > .05$, df = 16, two-tailed for decentration) (Fig. 3). The type 2 of substitution was observed in 3 children of the L group (33% children) and in 8 children of the H group (89%). The H group exhibited more children with significance ($\chi^2 = 5.84$, df = 1, $P < .02$, two-tailed). The progression from the type 1 to the type 2 of substitution was

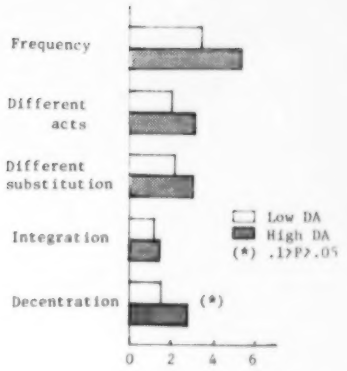

Fig. 3 Mean Scores of Two DA Groups in Type 1 of Substitution

Table 1 Total Number of Different Substitution Contents

DA Groups	Type 1		Type 2	
	signifier	signified	signifier	signified
Low	12	19	3	3
High	10	19	5	7

shown.

As seen in Table 1, there was no marked differences in the contents of either type of substitution between the 2 groups. The perceptual similarity between the signifier and the signified was observed in all substitution. Besides, the substitution reflected the children's experiences in their everyday life. The examples of substitution demonstrated by more than 2 children included a can as a rice bowl, a ball as an egg, a piece of string as a string for carrying a doll on his or her back (such a way of carrying a baby is a Japanese custom), a table as a stool, a Y-shaped twig as a pair of scissors or a lollipop, a sponge as a powder puff, a wooden block as a knife, and a bat as a golf club.

In the type 1 of substitution, the substitution supported by imitative use of the objects occurred more often in the L group than the H group (42% substitution for the L group and 11% for the H group). An instance of such substitution was eating with a rice bowl and then eating with the rice bowl and small twigs as a pair of chopsticks. The sub-

stitution emitted by the previous action was observed in 3 children of the H group who did not show invention yet. An example of such substitution was winding a piece of string around his or her body and then carrying a doll on his or her back with the string.

DISCUSSION

The same developmental process of decontextualization was obtained in DS children as that in nonretarded children revealed by the author's previous study (Shimada et al., 1981): that is, the progression of imitative use → the type 1 of substitution → the type 2 of substitution → invention. Since the 2 groups did not differ in the type 1 of substitution except for one measure, the gap of substitution between the 2 groups may be considered to depend on the onset of the type 2 of substitution. The measure which did not show the differences between the 2 groups was merely the number of different substitution. It was also supported by the contents of substitution. In other words, the repertory of substitution itself hardly increases in DS children at this DA level, while the repertory of acts does in substitution.

When re-analyzing the data of nonretarded children of Shimada et al. (1981, 1984), the number of different substitution tended to significantly increase between 22 and 30 months of age ($t = 1.81$, $.1 > P > .05$, $df = 13$, two-tailed). Moreover, 79% nonretarded children of 22 months demonstrated the type 2 of substitution, whereas 33% DS children did so in the L group of this study ($DA\bar{X}$ in the L group = 22.7 months). The difference of the number of children showing the type 2 of substitution was significant between the nonretarded and DS children ($\chi^2 = 4.70$, $P < .05$, $df = 1$, two-tailed).

Decontextualization is regarded as the process of distancing between the signifier and the signified. Therefore, delayed emergence in type 2 of substitution and little increment in the repertory of subinstitution suggest a relation to delayed language development in DS children.

The substitution supported by imitative use of objects appeared more often in the L group, and the substitution emitted by the preceding action occurred in the children of the H group who did not demonstrate invention yet. In the author's prior study with nonretarded children (Shimada et al., 1979), the same developmental process was observed: namely, the type 1 of substitution with support of imitative use → the type 1 of substitution without any support of imitative use → the type 2 of substitution → the substitution emitted by the previous action. Such transition may be interpreted as those mentioned below. Children can perform substitution based on merely resemblance between the signifier and the signified, after assuring the actions of substitution supported by imitative use of objects. Following the substitution with miniature toys producing additional meaning based on the similarity, the representation of actions is more assured. And then invention, gestural expression without any material support, emerges.

Thus, the shift in dominance of a perceptual resemblance and actions suggests the onset of subskills in decontextualization. Since the substitution with miniature toys, which demonstrated double knowledge of the objects as well as dissimilarity between the signifier and the signified, appeared at later months than invention (Saso et al., 1981), the development of making a story may also function as a factor.

SUMMARY

The purpose of this study was examine developmental processes of substitution in DS children and to clarify the onset mechanism of subskills in decontextualization.

The subjects were 18 Down's syndrome children with a DA range of 21-35 months who were divided into 2 DA groups. The children were individually tested with lifelike objects, miniature toys and ambiguous objects.

The developmental process of decontextualization in DS children was the same as that in nonretarded children of the previous studies. However, the onset of substitution showing double knowledge of objects (type 2) was delayed and the repertory of substitution hardly increased. The results suggest a relation to delayed language development in DS children. Further analyses of substitution suggest the shift in superiority of perceptual similarity and actions for the onset of subskills in decontextualization.

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ダウン症幼児の象徴遊びにおける見たて使用の発達

キーワード：象徴遊び，見たて，脱文脈化，ダウン症幼児

本研究は，象徴遊びにおける見たて使用の発達と，脱文脈化における下位スキル出現メカニズムの検討を目的とした。被験者はダウン症児18名（CA 29−55ヶ月，DA21−35ヶ月）であり，DAを基準にして9名ずつ2群別にし，一定材料を用いて個別観察をした。ダウン症児における脱文脈化の発達過程は，健常児を対象とした諸研究の知見と同一であった。しかしながら，慣習的意味に新たな意味を付加する見たて2の出現が遅れ，見たての種類の増加が緩慢であり，言語発達の遅れとの関連性が示唆された。見たて使用の分析から，脱文脈化における下位スキル出現メカニズムとして，能記−所記の類似性と行為における優位性の交替が示唆された。